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(54) Farinaceous foodstuffs

(57) A paste for forming shaped farinaceous foodstuffs, such as noodles, spaghetti, macaroni and instant noodles, comprises mainly a mixture of hard wheat flour and soft wheat flour and a mixture of (a) an alkali metal or alkaline earth metal salt of monophosphoric acid and (b) an alkali metal or alkaline earth metal salt of diprophosphoric acid, suitable in a weight ratio, of, a : b, of from 8 : 2 to 9.5 : 0.5. The paste preferably contains from 0.1 to 1.0% by weight of the mixture of components (a) and (b) and such mixture is preferably a mixture of dipotassium monophosphate and sodium diprophosphate. The incorporation of the mixture of components (a) and (b) makes it possible to produce improved products from mixtures of hard and soft flour containing increased amounts, e.g. up to 50% by weight, of soft flour. The invention also provides dried uncooked and cooked shaped farinaceous foodstuff prepared for the paste as well as the mixture of components (a) and (b) as an additive for improving pastes for use in preparing shaped farinaceous foodstuffs.

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SPECIFICATION

Farinaceous foodstuffs

- 5 This invention is concerned with improvements in and relating to farinaceous foodstuffs, more particularly shaped farinaceous foodstuffs of the so-called "pasta" type such as noodles, spaghetti, macaroni, instant noodles and the like. Such shaped products are prepared by forming a paste comprising mainly wheat flour and water, optionally together with other ingredients, forming the paste into the desired shape (e.g. by extrusion or moulding) and subsequently cooling the shaped product, possibly after drying it. In the
 10 following description, for the sake of simplicity, such products will simply be referred to as "shaped farinaceous foodstuffs".

Depending on their quality, shaped farinaceous foodstuffs are prepared from pure durum wheat flour or from mixtures of durum wheat flour and soft wheat flour. The quality of the prepared shaped farinaceous foodstuff is basically determined by the production technology conditions and the nature and condition of
 15 the raw materials used to prepare it. In addition to the edibility, the rheological properties of the paste are also very strongly influenced by the quality and condition of the raw materials. In particular, the content and condition of the gluten, which makes up about 80% of the total protein in wheat flour, determine these properties. Canada durum, which is predominantly used for high grade shaped farinaceous foodstuffs, has a high content of elastic gluten. This gluten prolongs the cooking time and imparts a loose, elastic and
 20 voluminous consistency to the cooked product: the surface is smooth and only slightly mucilaginous, and the "bite" can be characterised as firm and smooth.

Shaped farinaceous foodstuffs made from pure soft wheat flour have, on account of the poorer quality of the gluten therein, properties that do not satisfy the edibility requirements. There is the danger that such farinaceous foodstuffs can easily be overcooked, the bite is too soft, and the surface is mucilaginous.
 25 Moreover, the paste requires the addition of a fairly large amount of water, resulting in an increased expenditure of energy for drying. For this reason, mixtures of durum grits and soft wheat fines are used to achieve a good edible quality. These mixtures represent a compromise between an acceptable quality on the one hand and an economical preparation method on the other hand, since high grade durum grits are considerably more expensive than soft wheat fines.

30 The difficulties arising from this compromise are especially apparent when preparing shaped farinaceous foodstuffs under large kitchen and canteen conditions. In these cases farinaceous products have to be kept for a fairly long time in hot water, and it is found from experience that this leads to overcooking and the formation of sticky lumps. Attempts have been made to improve shaped farinaceous foodstuffs by reducing the mucilaginous condition of the surface by the addition of monoglycerides. The results were however
 35 unpredictable and variable, and above all the problems of the unsatisfactory resistance to overcooking and the unsatisfactory bite were not solved.

It has now surprisingly been found that shaped farinaceous foodstuffs formed from mixture of durum wheat flour and a lower grade cereal flour (e.g. soft wheat fines) and having substantially improved cooking properties can be prepared if certain phosphate mixtures, as hereinafter defined, are added to the paste. The
 40 rheological properties of the paste can also be advantageously affected by the addition of such phosphate mixtures. Substantial improvements in quality can be achieved within a wide mixing ratio of durum grits and soft wheat fines by adding the phosphate mixture and by virtue of the resultant improvement in the hydration properties of the gluten. In particular, the amount of soft wheat fines added can be increased without any loss in quality. This is particularly beneficial in the case of large-scale use and when using the
 45 noodles in food preserves, in which they are subjected to a high thermal stress during sterilisation. For example, with a 50 : 50 durum/soft wheat mixture with the addition of phosphate mixture, the same quality can be achieved as with a 70 : 30 mixture without the addition of phosphate mixture.

The phosphate mixtures used in accordance with the invention comprise mixtures of (a) an alkali metal alkaline earth metal salt of monophosphoric (orthophosphoric) acid and (b) an alkali metal or alkaline earth metal salt of diphosphoric acid.

50 Accordingly, one embodiment of the invention provides an additive for improving the characteristics of a shaped farinaceous foodstuff which comprises a mixture of (a) an alkali metal or alkaline earth metal salt of monophosphoric acid (hereinafter simply referred to as a "monophosphate") and (b) an alkali metal or alkaline earth metal salt of diphosphoric acid (hereinafter simply referred to as a "diphosphate").

55 The invention also provides a paste for forming a shaped farinaceous foodstuff formed from a mixture of hard wheat flour and soft wheat flour and containing a mixture of an monophosphate and a diphosphate; a dried, uncooked shaped product formed from such a paste; and a cooked shaped farinaceous foodstuff formed from such a paste.

60 Examples of mono- and diphosphates which may be used in accordance with the invention include mono-, di- and tri-sodium diphosphate, the corresponding potassium salts, and mono-calcium phosphate, dicalcium phosphate and tricalcium phosphate. A particularly useful mixture is a mixture of dipotassium mono-phosphate and sodium diphosphate.

65 The weight ratio of monophosphate to diphosphate is preferably from 8 : 2 to 9.5 : 0.5, more preferably about 9 : 1. The monophosphate/diphosphate mixture is suitably added to a paste for forming a shaped farinaceous foodstuff in an amount of from 0.1 to 1% by weight, preferably from 0.3 to 0.5% by weight, based

on the total weight of the paste.

The effect of the monophosphate/diphosphate mixture can be enhanced by the additional use of additives such as emulsifiers, binders, native proteins, and ascorbic acid.

The following tests illustrate, by way of example, the effect of using a monophosphate/diphosphate mixture in accordance with the invention in the preparation of a paste containing a fairly high proportion of soft wheat flour. 5

Noodles were prepared in strip form in a conventional manner and then cooked, in 1% salt water for 12 minutes. The noodles were made from a paste prepared from 700g of a mixture of hard and soft wheats (in the ratios given in the Table below), 292 g of water in which one egg was suspended, 8g of cooking salt and, 10 in the case of noodles in accordance with the invention, 3g of a mixture of 9 parts by weight of dipotassium monophosphate and 1 part by weight of disodium diphosphate. 10

TABLE 1

15	Test	Hard Wheat (g)	Soft Wheat (g)	Ratio	Phosphate addition (g)	15
20	1	560	140	80 : 20	-	20
	2	420	280	60 : 40	-	
	3	280	420	40 : 60	-	
25	4	140	560	20 : 80	-	25
	5	-	700	-	-	
	6	560	140	80 : 40	3	
30	7	420	280	60 : 40	3	30
	8	280	420	40 : 60	3	
	9	140	560	20 : 80	3	
35	10	-	700	-	3	35

The mouth feeling, outside appearance and firmness (or elasticity) of the cooked noodles were then evaluated by a test panel. 40

The dimensional stability of the noodles at the end of the cooking time was taken as a measure of the cooking behaviour. The results are given below.

Noodles of tests 1 and 2

45 The noodles exhibited a smooth surface, there were no changes in shape, and the bite was normal.

45

Noodles of test 3

The noodles exhibited a less smooth surface, showed slight changes in shape, and the bite was softer.

Noodles of tests 4 and 5

50 The noodles were less smooth, had a slightly rough and sticky surface caused by cooking losses, the bite was too soft, and some of the noodles had disintegrated.

50

Noodles of 6 and 7

55 Appearance that of a comparable commercially available product, strength and bite very good, not sticky.

55

Noodles of test 8

Appearance corresponding to that of a commercially available product, bite normal, not sticky.

Noodles of tests 9 and 10

60 Pale, slightly spongy appearance, somewhat softer bite, slightly sticky surface.

60

CLAIMS

1. A paste for forming a shaped farinaceous foodstuff containing a mixture of hard wheat flour and soft wheat flour and also containing a mixture of (a) an alkali metal or alkaline earth metal salt of monophosphoric acid and (b) an alkali metal or alkaline earth metal salt of diphosphoric acid. 5
2. A paste as claimed in claim 1 in which the weight ratio of component (a) to component (b) is from 8 : 2 to 9.5 : 0.5. 10
3. A paste as claimed in claim 2 in which the said weight ratio is about 9 : 1.
4. A paste as claimed in any one of the preceding claims in which the said mixture of components (a) and (b) is a mixture of dipotassium monophosphate and sodium diphosphate. 15
5. A paste as claimed in any one of the preceding claims containing from 0.1 to 1.0% by weight of the said mixture of components (a) and (b).
6. A paste as claimed in claim 5 containing from 0.3 to 0.5% by weight of the said mixture of components (a) and (b). 20
7. A paste as claimed in any one of the preceding claims in which the mixture of hard wheat flour and soft wheat flour contains up to 50% by weight of soft wheat flour. 15
8. A paste as claimed in claim 1 substantially as hereinbefore described. 25
9. A dried, uncooked, shaped farinaceous foodstuff prepared for a paste as claimed in any one of the preceding claims.
10. A cooked shaped farinaceous foodstuff prepared from a paste as claimed in any one of the claims 1 - 8. 30
11. An additive for improving the rheological properties of a paste for preparing a shaped farinaceous foodstuff prepared therefrom comprising a mixture of (a) an alkali or alkaline earth metal salt of monophosphoric acid and (b) an alkaline metal or alkaline earth metal salt of diphosphoric acid. 35
12. An additive as claimed in claim 11 in which the weight ratio of component (a) to component (b) is from 8 : 2 to 9.5 : 0.5. 30
13. An additive as claimed in claim 12 in which the said weight ratio is about 9 : 1. 35
14. An additive as claimed in any one of claims 11 - 13 in which the mixture of component (a) and component (b) is a mixture of dipotassium monophosphate and sodium diphosphate.
15. An additive as claimed in claim 11 substantially as hereinbefore described. 40
16. A method for preparing a paste for the preparation of a shaped farinaceous foodstuff and containing a mixture of hard and soft wheat flours in which an additive as claimed in any one of claims 11 - 15 is added to the paste. 45
17. A method as claimed in claim 16 in which the additive is added in an amount of from 0.1 to 1.0% by weight based on the weight of the paste. 50
18. A method as claimed in claim 17 in which the additive is added in an amount of from 0.3 to 0.5% based on the weight of the paste. 55
19. A method as claimed in claim 16 substantially as hereinbefore described. 60